



Land use and hydromechanical heterogeneities in marshland soils.

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In the interpretation of soil moisture profiles, mechanical properties were most often considered homogeneous. The structural heterogeneities of the soil are known to be at the origin of the distribution and the availability of water in the vadose zone. The soils study is located in the French Atlantic coastal marshlands, characterized by the succession polderization/desiccation/consolidation and maturation. The work is carried out within the framework of the farming of old salt marshes with two concerns in the farmers: the salinity of the soil and the distribution of the available water capacity of the soils according to the crop growth. The present work shows the knowledge of the soil storage transfers during seasonal cycles on drained corn field and undrained grassland. We analyze the vertical water profiles observed to reveal the hydromechanical heterogeneities in the soils depending the porosity and gravity water parameter. This approach is based on mechanical tests between the compaction pathways carried out in the laboratory using materials taken in situ. Comparing to grasslands profiles, we highlight the influence of agricultural practices and the establishment of drainage in the marshland. However, the vertical homogenization of hydromechanical structures, desalination has been taken into account for the estimation of water in crop. The concept of a homogeneous structure is not adapted to real vertical profile. Finally, the authors conclude by discussing the notion of the mechanical availability of water in terms of porosity and gravity water. These parameters are good tools to the sustainable management of marshland soils.

Keywords: hydromechanics, vadose zone, soil structure, land use, available water capacity